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ABSTRACT

This study which involved 60 kindergarten and 69 second grade students sought to identify a significant relationship between internal control perception and creativity. Internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control. The Bialer (1961) locus of control scale and two creativity measures (Instances and Uses) adapted from Wallach and Kogan's (1965) creativity tasks were employed to test fluency, uniqueness and flexibility. The results do not present a clear pattern of findings. For all female subjects (particularly second graders) internality correlated with creativity as measured by the Instances creativity measure. For male kindergarten subjects, low internality correlated with creativity as measured by the Uses creativity measure. It cannot be concluded that all internals share creativity as a behavioral competency. Tables and appendixes provide facsimiles of measures used as well as additional questionnaires and creativity measures. (Author/MK)

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INTERNAL--EXTERNAL LOCUS OF CONTROL AND CREATIVITY

BY

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I INTERNAL--EXTERNAL LOCUS OF CONTROL

A. Introduction

Lefcourt (1966) defines the internal--external locus of control of reinforcement as:

> ... a general principle, internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behaviors in certain situations and therefore beyond personal control (p. 207).

The internal--external locus of control of reinforcement, subsequently referred to as the I-E construct, is a derivation from Rotter's (1954) social learning theory. Rotter defines personality as a construct which describes that aspect of a unified, complexly organized person having to do with his characteristic modes of behaving or of interpreting the world in which he lives (Rotter, 1954, p. 82). Rotter conceives of behavior as having direction or being goal directed. He sees personality as a "...directional interaction of the organism and his meaningful environment," (Rotter, 1954, p. 99).

The I-E construct is also an outgrowth of Angyal's autonomous and active mastery, Adler's superiority striving concept, and conversely, Merton's alienation, Seeman's powerlessness, and Mowrer and Viek's helplessness. In comparison, however, the I-E construct refers not to actual behavior, but to a generalized perception of the extent to which events are contingent upon one's own behavior (Lefcourt, 1966; Rotter, 1966).

The I-E construct is thus more similar to Heider's locus of causality concept and DeCharms' (cited by DeCharms, 1968), Origin-Pawn concept, referring to the extent to which one sees himself as having personal power over events. Rotter (1954) pointed out that persons who generally believe they can have a large measure of control over desired outcomes, anticipate or expect to accomplish their goals or gain desired

outcomes. Since one's expectations would seem to involve certain motivational orientations, the I-E construct is concerned with numerous views of the processes by which behavior is impelled and sustained.

The I-E construct thus relates closely to recent conceptions of motivation including White's (1959) effectance motivation or striving for competence and mastery; the incongruity-dissonance principle in which new, but not too new stimuli is sought (Hunt, 1964); cognitive strivings which include such concepts as curiosity, exploration, and cognitive-dissonance (Hunt, 1963); activation and affective motivational states such as anxiety and pleasure arousal; and more transactional motives such as achievement and affiliative motivation (Hunt, 1964; White, 1959). The behavioral striving conception of motivation restates human interaction as an outcome of active rather than passive processes.

B. Reinforcement

The I-E construct is often referred to as the internal-external locus of control of reinforcement. However, several studies have demonstrated that persons who are internal also seek more intrinsically valued experiences (Rotter & Mulry, 1965). In addition, internals have been found to be less responsive to the value systems and rewards of other persons (Liberty et al, 1966). Furthermore, internals have been found to resist conditioning and subtle influences over their behavior (Getter, 1966).

The behavior of internals includes high levels of competence seeking in task and social situations (Lefcourt, 1966). It appears that a major motive of an internal is the mastery of his capacities and assertion of his self. Such striving has been termed self-actualization by Maslow (1967).

Conversely, the behavior of externals appears to be enhanced via explicit statement of reinforcements. The external guides his behavior as required by external contingencies (Lefcourt, 1966, 1968). Externals have been found to seek

less information concerning their situation, to be more conforming, risk less in situations of personal control and to be more influenced by situational cues than internals (Lefcourt, 1966, 1968). The picture of internals, however, is a more consistent and predictable one.

Since internals have been found to be less concerned with external reinforcement than externals, the use of reinforcement within the I-E concept can be misleading. In addition, reinforcement learning theory views the origin of behavior and its control as largely external to the person. Perhaps, externals as demonstrated in numerous studies, best fit into the reinforcement learning theorist's passive model of behavior.

A number of variables, internal and external to persons affect what impels and sustains their behavior. Bijou and Baer (1961, p. 17), call these variables setting events. Setting events include factors within the person such as: the biological structure and physiological functioning of the organism; the structure of one's self during social interactions; factors external to the person such as physical and chemical properties of the environment; and the appearance, actions, and interactions of external persons. Nevertheless, research in operant conditioning with humans speaks of shaping behavioral responses, of making reinforcement contingent upon performance of certain behaviors and thus bringing behavior under external stimuli control. The passivity of the behaviorist model would seem to be a necessary correspondent of its focus on observable behavior.

Yet there are numerous findings indicating the existence of a mechanism of internal control. In operant work, experimenters often find it necessary to provide certain children with particularly desired reinforcers in order for successful behavioral shaping to occur (Hunt, 1966; Whelan & Haring, 1966). This fact seems to indicate the existence of a choice of action made by the child. Perhaps, persons who are external in their control perception do in fact make fewer choices of their own. With some persons, however, the factor of choice is critical in determining a course of behavior,

except when there are severe conditions or strains. Even under such conditions, there are instances in which persons' self-reinforcement must be seen as accounting for the "extensive self-regulation among humans which occur in the absence of external regulations," (Heilbrun & Norbert, 1970).

What may be learned in operant conditioning could be more adequately conceptualized in terms of the transactional realities of behavioral exchange. In other words, although certain behaviors are required to obtain desired ends, a person is not merely a passive being whose behavior is shaped through the manipulation of contingencies (Gergen, 1969). For example, James & Rotter (1958) employed chance and skill conditions with a task and found that the perception of skill by some persons mediated the extinction of behavior even under chance conditions. A study by Getter (1966) further demonstrated the control persons can exert in operant conditioning experiments if they do not want to be conditioned or when they mistrust subtle influences.

C. Contingency

Some individuals are apparently less concerned with the reinforcement per se than with the information it yields about the nature of the contingency's requirements. A number of studies, for example, have recently been concerned with the clarity of the contingency. Several related studies on giving explicit instructions, providing for communication, verbalization during problem solving, and verbalization of affective experience indicate the presence of an intermediating variable in operant conditioning. It appears that the subject somehow comes to cognitively guess the contingency of reinforcement and may even be able to verbalize it to himself (Lovaas, 1961; Levin, 1961; Gagne & Smith, 1962; Hicks, 1968; Doctor, 1969; Staats, 1964).

Moore and Olson (1969) in a study providing explicit instructions to a young child on prohibited behaviors suggest that verbal information about acceptable and unacceptable behavior should be paired with contingent attention and with favorable

consequences after the behavior occurs. This pairing may result in finer stimuli discriminations and faster learning. Such views see the child as having an assertive role within the reinforcement contingency framework.

An operant conditioning study performed by the author with a teenage boy diagnosed as mute catatonic schizophrenic, provides a relevant example. Social reinforcers were cut to a minimum and instead primary reinforcers (M&M candy) were used to reinforce the minimal word phrases which occurred. After ten sessions, the occurrence of intelligible phrases had increased from 11 one word utterances to 32 more complex ones. On the eleventh session, the experimenter increased eye and facial attention along with more natural emotional affect when commenting: "Good. Tell me more." Whenever the subject stopped talking, the experimenter looked away and paid no attention to him until he resumed talking. Candy was still administered. Responses jumped to 105, 148, and 120 and averaged around 120 in subsequent sessions for several months even without candy. Eventually, this boy was able to participate in psychotherapy and tutoring thus enabling him to lead a more healthy life (Oden, 1966). The main point here is that the subject could increasingly expect to maintain some control over the events through his own behavior.

In the above experiment, the experimenter related the course of his actions in a predictable way to the actions of the subject. However, it is not clear that he alone brought the stimuli under control. Since the experimenter controlled his behavior in relation to the subject and the setting, the subject was in a position where he was better able to predict the outcomes of his own behaviors. Thus the reinforcer may actually have been most forceful in the information it provided as a cue concerning the relationship between the subject's behavior and the given contingency framework. The locus of control may thus reside within or between the subject and experimenter and in natural settings within persons and between persons. The I-E construct thus provides further insight into what Lefcourt (1966) called the "contingency between act and effect," (p. 206).

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D. I-E Locus of Control as a Personality Variable

The early research on the I-E construct was mainly experimental in nature in which task setting conditions were varied according to chance or skill. In these experiments, the role of control perception as a mediating factor in behavioral operations was verified (Lefcourt, 1966). Later studies attempted to establish the relationship between I-E as a personality variable and other measures of personality attributes such as nonconformity and behavioral competence such as achievement.

There have been few consistent findings where personality attributes and behavioral competencies appear to comprise a cluster or pattern of characteristics in addition to internal or external locus of control perception. As discussed previously, it has generally been found that internals share more common characteristics than externals (Hersh & Scheibe, 1967). Even within the internal group, however, there are many disputed findings and gaps in knowledge. A more complete picture of the pattern of shared characteristics of internals is not yet available.

a. Achievement

The literature on achievement, risk-taking, conformity, and information-seeking is most relevant to this study. In reference to studies on achievement and learning, Lefcourt (1966), states: "...the construct allows some prediction when the materials are relevant to the subject's goal strivings," (p. 214). Successful prediction, however, is found only for males.

In a study by Crandall et al (1965) with children in which the Intellectual Achievement Responsibility Questionnaire was employed, responsibility attribution was found to be related to most achievement criteria for males in terms of time spent in intellectual free play activities, intensity of striving in intellectual free play activities, and reading and arithmetic test performances. It was not found to be significant for females. The suggestion was made that perhaps even high achieving females do not share the same

values. Need for achievement was not found to be related to control perception. This was also a finding of a number of other studies (Lefcourt, 1966).

Apparently, the reasons for achieving on the various criteria measured are not simply for the sake of high achievement or for need approval in the case of high internals. Other motivational factors such as competence striving and differences in values among male and female children high in achievement and internal or external control need to be investigated.

b. Risk-taking

In a study by Liverant and Scodel (cited by Lefcourt, 1966) persons were to bet in chance determined situations. They found that low externals had a greater tendency towards self-regulation with regard to objective probabilities. Low externals most often selected bets of intermediate probability and lower probability bets than high externals. Even though low externals were more cautious, they were cautious in terms of objective probabilities in control situations that were chance determined. In skill conditions, internals do appear to risk more than externals (Lefcourt, 1966).

Natural settings, however, are neither totally chance nor skill determined, and it is unclear whether or not internals usually risk more or less than externals. It may be predicted, however, that in areas or situations which can be more internally controlled such as information-seeking and mastery striving, internals do risk more than externals. Again, internals may be moderate in risk-taking in areas where control is more external to them or determined by imposed external criteria unrelated to their particular skills or abilities.

c. Conformity and Information-seeking

Getter's (1966) study cited earlier is an example of internals resisting conditioning in verbal conditioning experiments. In these experiments, internals did not

manifest learning until reinforcement was discontinued. (Seemingly, they viewed their locus of control as internal.) Rotter and Mulry (1965) found that self-determined rewards were of greater value to internals under skill conditions. Julian & Katz (1968) and Liberty et al (1966) reported similar findings. In Gore's (1963) study internals resisted subtle influences of interviewers. Lefcourt (1968) found that externals were very responsive to situational cues whereas internals revealed almost no response to experimental manipulations. Yet internals, when desirous of certain reinforcements or intrinsically rewarding activities, will respond more appropriately to task demands than externals (Julian & Katz, 1968; Rotter & Mulry, 1965; and Lefcourt, 1968). Internals will also take a longer time to make decisions when the choices are more difficult to discriminate and success is contingent upon accuracy of decisions (Lefcourt, 1968). Internals demonstrate more task oriented involvement and take more risks than externals in skill determined situations or those situations perceived as involving more internal control.

Studies by Odell (cited by Lefcourt, 1966) and Crowne and Liverant (1963) where Asch-type conformity situations were presented, found that internals were less conforming than externals and were more confident in terms of willingness to wage bets on their own perceptions, especially in independent trials. Crowne and Liverant (1963) stated that the conformer has less expectation of success in evaluative situations which thus leads to failure avoidant behavior in the future. Such defensiveness increases as personal committment does. Apparently, externals are more conforming and thereby less willing to risk trusting their own perceptions in seeking success.

Internals actively seek, remember, and utilize more information in skill and ambiguous conditions and for the future than externals (Seeman & Evans, 1962; Seeman, 1963; Davis & Phares, 1967; Phares, 1968). Studies by Child and Waterhouse (cited by Lefcourt, 1966), concerning emotional responses to frustration and Butterfield's (1964) correlational study with I-E both indicate that internals see themselves as reacting

in more problem-solving directions, regardless of frustration and see themselves as wasting less time on guilty self-degrading thoughts. It would appear that internals are more growth motivated in a self-actualizing sense and prosper in situations of high internal control.

The major aims of these studies have been to provide a clearer pattern of characteristics common to internals and externals as groups. Implicit in several studies was the question of whether or not internal control perception, for example, is a necessary condition for various cognitive and behavioral competencies as well as numerous personality attributes. Correlational studies alone which represent the bulk of the research employing locus of control as a personality variable cannot establish the more specific functions of the locus of control perception. Experimental work is needed here. The shared characteristics, however, of internals are strongly similar to those found for creative persons. DeCharms (1968) suggests that due to similarities between the nature of the creative process and activities of internal and external persons, there may be some relation between locus of control perception and certain conceptions of creativity.

Since internals for example, become more involved in skill tasks and problem solving as they seek and often risk their own individual solutions rather than the obvious or expected behavior, they would seem to be engaging in the creative process. Such investigation even within a correlational design may yield hypotheses concerning the processes and mechanisms of the control variable as it operates in relation to various cognitive and behavioral competencies and personality attributes such as those involved in creative behavior.

II CREATIVITY

Creativity refers to a person's ability to produce unique and effective formulations of problems, approaches, expressions, solutions, and inventions (Wallach & Kogan, 1965; Guilford, 1967; Torrance, 1966). Theoretical and experimental evidence indicate that creative products result from cognitive processes, personality attributes, and behavioral strategies that are qualitatively different from processes which result in more conventional outcomes. Wallach and Kogan (1965) suggest that personality attributes interact with cognitive processes throughout development resulting in characteristic modes of thought for a given person. Numerous investigations also indicate commonalities in personality and cognitive processes of persons who exhibit creative behavior.

A. Cognitive Style

Cognitive theorists generally focus attention on the ways in which creative persons obtain, organize, and transform informational input to seek effective and inventive associations and solutions (Cropley, 1967; Bruner, 1966). They view human activity as involving active exploration of stimuli situations, internal and external to the system as opposed to passive reception. They are concerned with cognitive risk-taking, openness to large scopes of information, and the processing of information. The characteristic manner in which information is taken into the cognitive system is referred to as cognitive style. A number of styles have been demonstrated such as field independence-dependence and scanning-focusing.

Some cognitive styles appear to be more conducive to the production of creative behavior. According to Cropley (1967), "those people whose cognitive style involves the least censory of information available," are more likely to be the creative thinkers (p. 40). For example, field independence would allow one to go beyond the limitations

of a given setting for ideas, and scanning widely would be more likely to yield more varied information for ideas.

Within the cognitive system it appears that the processes involved allow for the connection of new data with past data which it resembles in some aspect (thus, called coding), and then relating it to a further set of data (thus, called a category). The process and product can be either highly typical, stereotyped, or predictable, or creative, that is, novel, unique, and effective.

The wider one categorizes new data, the higher the likelihood of coming up with a creative association. Very fine discriminations between bits of input require high levels of similarity before relationships or similarities are seen (thus, wide categorizer vs narrow), (Cropley, 1967).

One could conceivably be adept at focusing on a few bits of input and through a process of narrow categorizing, make discriminations which result in a unique association. Generally, however, such ability would seem to be related to experience in making many comparisons across categories and wide spans of input, thus the importance of fluency of associations in creativity measures (Wallach & Kogan, 1965). Although creativity involves the fluency of associations, flexibility of moving from category to category, and elaboration of a given stimuli or association, uniqueness or originality, however, is the mark of creativity.

Guilford (1967) conceptualizes the basic operational difference between creatives and noncreatives as involving a greater use of what he calls divergent processes as opposed to convergent ones. Divergent operations are simply those which take inputs and use them in a wide range of different possible ways. Convergent operations take limited, obvious features of input and use them in narrow and limited ways resulting in conventional associations and outputs.

It has been suggested that the nature of the convergent thinking process is directed toward supplying the most predictable, conventional answer that will be considered

"right" due to its frequency of agreement and occurrence. The tendency to produce unique results as opposed to obvious ones, is seen by many researchers as largely a function of personality attributes interacting within cognitive processes. Thus the existence of any given cognitive style of operation appears to be largely affected by personality attributes.

B. Creative Processes and the Setting

Several researchers have suggested various models of cognitive systems which attempt to describe the nature of those processes which lead to a creative response.

Guilford's (1967) own transfer learning theory of productive thinking describes retrieved information, stored and used in combination with newly gained information. His basic thesis is that information used in some new way or context results in novel productive thinking. This process is seen as requiring a prior time period or incubation time. Guilford relates incubation as a concept to rest intervals in the problem solving literature and to spaced practice in the learning literature. Guilford considers insight to be a sudden transformation or intuitive leap. He sees the significant step in the creative process as the formulation of a new system. He sees this system as relying heavily on informational feedback for evaluation and reconstruction of the setting and outputs of the cognitive processes.

Torrance (1966) views creativity as:

> ...a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results (p. 6)

Apparently, the values of a given culture or setting are an important influence on the creative process. Numerous studies have examined the creative process and the cues of the setting. It has been found that many school settings, for example, encourage rigidity and conformity, reward boys more than girls for creativity, restrict

manipulation and curiosity in explorative activities, overemphasize "success" and the "right" answer (Torrance, 1961; Adams, 1968).

Ward (1968 b) in a study of impulsive-reflective cognitive style in relation to creativity concluded that cognitive style alone does not determine the child's carefulness in decision-making, but contextual cues also affect the thoroughness with which possibilities of responses are evaluated by the child.

Wallach and Kogan (1965) have particularly emphasized the importance of a non-pressured, nonevaluative atmosphere. In the administration of their tasks they encourage a pleasant atmosphere with the child. Further, their tasks are not timed in order that the creative process can flow. This related very closely to their conceptions of the creative process:

> ...First, the production of associative content that is abundant and that is unique; second, the presence in the associator of a playful, permissive task attitude...accounts consistently stress the ability to give birth to associative content that is abundant and original, yet relevant to the task at hand rather than bizarre...the question of associative flow (p. 289).

C. The Creative Person

Numerous shared personality attributes of creative persons have been found. Cropley (1967) has summarized these findings. Playfulness was found by Getzel and Jackson (1962) to be a characteristic trait of creative persons. Creatives tend to play and experiment with words and their meaning and make up stories a good deal. They seem to enjoy a playful attitude. Creative persons exhibit a sense of humor. By pairing unusual aspects of words or events, they tend to see and express a great deal more humor than noncreatives. Weisburg and Springer (cited by Cropley, 1967) found a sense of humor to be the most discriminating difference between creatives and noncreatives.

Helson (cited by Cropley, 1967) found that creatives risk more in exploration and openness to a wide range of topics than noncreatives.

Creatives were also found to be nonconforming, less constricted by others. more spontaneously impulsive, flexible, and expressive. Luria (cited by Cropley, 1967), found that creative persons maintained control of their behavior through their own internalization of adult verbalizations. Crutchfield (cited by Cropley, 1967) found that when evidence of their sense tells creatives the group is in the wrong, they are nonconforming and will stick to their own ideas. Barron (cited by Cropley, 1967) also found creatives to be less externally controlled, although this attribute has not been experimentally demonstrated to this author's knowledge. Cropley (1967) saw the relationship between creativity and control in creatives in their willingness to "have a go," that is, to try new things, especially in that they are willing to take mental risks.

Descriptions of creative persons, their motivations and activities are thus similar to those of high internal control perception. As reviewed earlier, internals according to the I-E contruct were also found to be less conforming in behavior than externals. They were also found to be high in risk-taking in situations of internal control. Internals appear to seek information, strive to control their environment, and become task involved. In addition, they are high in achievement and mastery seeking when compared with externals.

Creative persons were also found to exhibit these characteristics. They are also nonconforming, autonomous, take many mental risks, display openness to wide ranges of information and experiences, and become highly involved in intrinsically interesting activities.

It can be argued that internal control perception is a necessary condition for creative behavior. In order for a person to be creative and turn out creative products it would seem necessary for him to have a low need for approval or external control, especially in settings where creativity is not valued. Also, it would seem important for a creative person to be nonconforming or otherwise he would pursue more conventional modes of thought. Since internals are less externally motivated and controlled,

they are more free to develop divergent modes of thought and to thus be creative.

Relatively few studies have been done with children using the I-E construct. In contrast, numerous studies on creativity have been conducted with children of all ages. It would thus by of value to study I-E as a personality variable and creativity at primary school ages where less school experiences have had an influence. Further, a sampling at two grade levels may allow study of developmental differences both in respect to I-E control perception and creativity. Sex differences will also be analyzed as girls are often found to be less creative than boys.

A correlational analysis of two measures, one of I-E control perception as a personality attribute and one of creative behavior or production will be employed. This analysis may also lead to further hypotheses on the more specific function of personality attributes involved in the execution of a creative response. It is hoped more especially that this study will provide insight in the cognitive and behavioral consequences for those who perceive the locus of control as internal or external. It will be of particular interest to discover whether or not internals share a specific competence such as creativity.

III METHOD

A. Subjects

The subjects were 129 boys and girls, 60 kindergarten and 69 second grade children from an elementary school in Champaign, Illinois. Subjects were: male kindergarten, N = 31; female kindergarten, N = 29; male second grade, N = 39; and female second grade, N = 30. The mean age for kindergarten subjects was 5.6 years (range: 5 years--6 years, 10 months), and for second grade subjects, 7.7 years (range: 6 years, 8 months--9 years).

B. Measures

Three measures were employed:

a. Bialer Locus of Control Scale

The Bialer (1961) scale consists of 23 questions requiring a "yes" or "no" answer which purport to measure the subjects' perceptions of locus of control across situations. The measure is thought to be appropriate even for primary grade children as Bialer (1961) employed it with subjects as young as 6 years, 3 months. Gozali and Bialer (1968) also found the Bialer locus of control scale to have significant internal reliability when compared on original, reverse, and split-half response forms with a sample population of adult mentally retarded youths. Test-retest reliability coefficients were highly significant ($r = .84$, and $r = .67$, $p < .001$). Gozali and Bialer (1968) also found the Bialer scale to be independent of response-set bias as it did not correlate significantly with measures of acquiescence and tendency to present oneself as socially desirable. The Bialer (1961) scale also was found to correlate with Battle and Rotter's (1963) Children's Picture Test of locus of control with sixth and eighth grade children, ($r = -.42$, $p < .01$) where a high score on the Bialer scale is similar to a low score on the Children's Picture Test (see Appendix A).

b. Creativity Measures

Two creativity measures adapted from Wallach and Kogan's (1965) creativity tasks by Ward (1968a) for younger children were employed. Ward found the Instances and Uses measures to be significantly intercorrelated for male and female kindergarten subjects and for 7 and 8 year old male subjects (see Appendix B). The measures were scored by Ward for fluency (i.e. number of responses per measure) and uniqueness (number of responses occurring only once in the total sample tested). These indices were also found to be independent of IQ measures. Ward's Pattern measure did not intercorrelate significantly and was thus not employed in this study. The Instances and Uses tests are both highly semantic in content, although divergent in design. The Instances measure has four items and involves the naming of instances from large categories. The Uses measure has five items and involves the naming of various uses of given items. The current use of this instrument did not employ actual objects as examples of the items for the Uses measure as was originally the case (see Appendix C).

C. Procedure

Each child was individually tested by a female experimenter. Previous to testing, it was explained that the experimenter was someone studying different games for children. Each child was then encouraged to try some of the games. S was escorted to the experimental room and back to the classroom by E. On route to the experimental room an attempt was made to establish rapport and an atmosphere of relaxation and fun. The Bialer scale was administered first and followed by the creativity tasks. Exorbitant praise, candy, or prizes were not administered. During the creativity tasks, the experimenter attempted to maintain a natural social rapport using some social reinforcers such as "Okay" "Fine" "Hmm" and "Good." In the creativity tasks the child was encouraged to take all the time he needed. Actual objects were not used in the Uses creativity measure.

D. Scoring Procedure

a. Bialer Locus of Control Scale

Following Bialer, "yes" answers in most cases were scored as internal responses and given one point. High scores thus were an index of high internal control perception.

b. Creativity Measures

Instances and Uses tasks were both scored for fluency, uniqueness, and flexibility.

1. The Fluency score was determined following the procedures of Ward (1968 a) by counting the number of appropriate responses to each item. Fluency scores were summed for all items to yield two fluency scores, one for the Instances and one for the Uses measures. In order to eliminate responses which were bizarre or inappropriate to a given item, all responses were examined by two judges. Those responses which were judged by both judges to be in no way relevant or appropriate to the item were eliminated. The judges showed highly significant agreement with percentage indexes at 97 per cent for each creativity measure.

2. The Uniqueness score was patterned after Wallach and Kogan (1965) and Ward (1968 a). Each appropriate individual response was listed and its frequency of occurrence in the sample was counted. The uniqueness index, however, was determined according to Torrance's (1966) scoring methods, rather than Wallach and Kogan's or Ward's procedures where only those responses which were given by one child counted as unique. It seems that a response occurring three or four times within a substantial sample size is a relatively unique response. Limiting the criteria of uniqueness to only one occurrence of a response seems to emphasize the response's exclusiveness, rather than its degree of uniqueness to the sample. Following Torrance's scoring methods, those responses which were given no more than 5% of the time, that is, by 5% of the sample, were scored one point, and those which were given by more than 5% of the sample were scored as zero on uniqueness: 5% of N= 129 were 6 frequencies of

a given response. Thus, 6 or under frequencies of a response = 1 point. More than 6 frequencies = 0 points. Uniqueness scores were summed for all items to yield two uniqueness scores, one for Instances and one for Uses measures.

3. A Flexibility score patterned after Torrance (1966) was also employed. The rationale here was to provide an index which measured differences between subjects whose responses were limited to one category and those whose responses involved flexing between two or more categories. For example, one given subject may respond to the Uses item of a newspaper with making paper hats, paper airplanes, paper boats, thus never switching categories. Another child may respond by use of additional categories such as make paper hats, boats, airplanes, and using it to cover the table, a book, etc. Scoring was patterned after Torrance's (1966) categories for each creativity item of the Instances and Uses measures (see Appendix D). The total number of categories used for a given item by a subject was scored as the flexibility score. For example, if a total of 9 categories were used for a given item, then the flexibility score for that item was measured as 9 points. Scores were summed across items to yield two flexibility scores, one for the Instances and one for the Uses measures.

E. Results and Discussion

a. Analysis of Data

Data were subject to correlational (Pearson product-moment) analysis. Correlations (Pearson product-moment) between the Instances and Uses measures (fluency, uniqueness, and flexibility summed for each measure), and the Internal scores from the Bialer scale were also determined. Finally, correlational analyses for the creativity and internal control scores were applied to data by group characteristics: all subjects, males, females, kindergarten, second grade, males and females within grades.

b. Results

The intercorrelations between the two creativity measures, Instances and Uses

and the three scores, fluency, uniqueness, and flexibility were first determined for all groups and found to intercorrelate at highly significant levels. Table 1 below shows the intercorrelations of these measures for the total samples.

TABLE 1

CREATIVITY INTERCORRELATIONS

Measure	Fluency		Uniqueness		Flexibility	
	Instances	Uses	Instances	Uses	Instances	Uses
Inst. (Fluency)	...	...	...	...	...	...
Uses (Fluency)	.75	...	...	...	...	...
Inst. (Unique.)	.95	.76	...	...	...	...
Uses (Unique.)	.70	.94	.72	...	...	...
Inst. (Flex.)	.93	.70	.85	.63	...	...
Uses (Flex.)	.68	.86	.67	.80	.65	...

N = 129 male and female kindergarten and second grade subjects.
All correlations reached the $p < .01$ level of significance.

Intercorrelations between the three scores of fluency, uniqueness, and flexibility within each measure of Instances and Uses were the strongest. For example, within the Instances measure, uniqueness X fluency was highly significant ($r = .95$, $p < .01$) and within the Uses measure, uniqueness X fluency was also highly significant ($r = .94$, $p < .01$). This pattern of intercorrelations is similar to that found by Ward (1968); (see Appendix B).

Instances and Uses scores of fluency, uniqueness, and flexibility were then summed within measures for further analysis by group characteristics. Instances X Uses creativity scores were thus correlated according to grade and sex within grades. Some differences were found (see Table 2).

TABLE 2

CORRELATIONS OF INSTANCES X USES

Grade	Males	Females
Kindergarten	.54	.78
Second Grade	.80	.58

NOTE: All correlations are at the $p < .01$ level of significance.

For male kindergarten subjects and female second grade subjects, it can be seen that the two creativity measures, Instances and Uses, do not intercorrelate as strongly as they do for female kindergarten subjects and male second grade subjects. When all six creativity scores for the two measures (Instances and Uses) were intercorrelated for male and female subjects within grades and across the two measures, this pattern was again demonstrated. (This analysis only further details Table 2 and is therefore not presented here.) It thus appears that the two measures are not measuring the same phenomenon in these two groups.

For creativity scores, second grade subjects scored substantially higher than kindergarten subjects, but only slightly higher on internal control.

TABLE 3

MEANS AND STANDARD DEVIATIONS OF CREATIVITY AND INTERNAL SCORES

Measure	Kindergarten				Second Grade			
	Males (N=30)		Females (N=29)		Males (N=39)		Females (N=30)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Instances	62	34	67	40	94	49	98	35
Uses	42	17	44	23	60	29	59	23
Internal	12	3	10	3	14	3	13	4

NOTE: SD = Standard Deviation.

Instances X Uses creativity scores were correlated with Internal scores by group characteristics. The only significant intercorrelations were: for all female subjects (N=59), Internal X Creativity (Instances), $r = .33$, $p < .01$ and for all second grade subjects, males and females (N=69), Internal X Creativity (Instances) $r = .28$, $p < .01$. Subsequent analyses were then applied to yield correlations of Instances X Internal scores and Uses X Internal scores for male and female subjects within grades (see Table 4).

TABLE 4

INTERNAL LOCUS OF CONTROL AND CREATIVITY CORRELATIONS

Measure	Kindergarten		Second Grade	
	Males (N=31)	Females (N=29)	Males (N=39)	Females (N=30)
Internal X C(I)	-.03	.07	.23	.43*
Internal X C(U)	-.36*	-.13	.18	.21

NOTE: C(I) = Creativity Instances; C(U) = Creativity Uses

* $p < .01$

The hypothesis that there exists a significant relationship between internal control perception and creativity was confirmed for female second grade subjects ($r = .43$, $p < .01$). For male kindergarten subjects, the relationship was significantly inverse ($r = -.36$, $p < .01$). Thus for male kindergarten subjects, low internality was related to high creativity as measured by the Uses creativity measure, whereas for female second grade subjects, high internality related to high creativity as measured by the Instances measure. As indicated earlier, Instances and Uses did not appear to be measuring the same phenomenon with kindergarten males and second grade females as with other subjects. Nevertheless, for male and female second grade subjects, the Uses creativity measure and Internality did not relate in the same direction as for male and

female kindergarten subjects.

c. Discussion

The results do not present a clear pattern of findings. For all female subjects, particularly among second grade subjects, internality correlated with creativity as measured by the Instances creativity measure. For male kindergarten subjects, on the other hand, low internality correlated with creativity as measured by the Uses creativity measure. The hypothesis was thus supported by several groups and the inverse appeared in one group. It cannot be concluded that all internals share creativity as a behavioral competency.

Since there was a substantially lower correlation ($r = .54$, $p < .01$) between Instances and Uses scores for male kindergarten subjects and for female second grade subjects ($r = .58$, $p < .01$) than for female kindergarten subjects and male second grade subjects, it may be argued that the Uses measure was not consistently measuring the same phenomenon as the Instances measure. Since the Uses measure was administered without the use of actual objects as used by Ward (1968 a), it was thus more abstract and the nature of the responses of male kindergarten subjects and, to some extent, female kindergarten subjects may have differed from responses yielded by older subjects. Further, the Uses measure may have had less appeal for females as it is less semantic and seemingly more mechanical. However, no clear explanation is available since Ward (1968 a) administered the measures at the second grade level with males only.

Since the Uses measure was the second creativity measure administered, fatigue may have been an influencing factor for kindergarten subjects in particular. In order to continue responding on the Uses measure while fatigued, one may have had to be externally controlled.

Males, in general, may have been less attentive to employed measures since the experimenter was female, while female subjects may have been more attentive for

similar reasons. Thus, enhanced attentiveness to the tasks may have resulted in more accurate measures of the phenomenon for females.

Since the findings for the second grade subjects, males and females, significantly supported the hypothesis, it may be argued that older children also attended to the tasks more appropriately and more accurate measures of phenomenon were thereby found.

The measure of internal control perception appeared from informal observations to be too abstract for some kindergarten children. Also, females, in general, appeared less reticent than males in interactions with the experimenter. It is unclear what was being measured with the kindergarten subjects, particularly males, on all measures. These subjects may have responded because of idiosyncratic, response set, or arbitrary operations.

It may also be argued that the relationship between internal control perception and creativity changes, especially for males, as they develop and as they progress in traditional classrooms. Kindergarten is less structured in many respects when compared with the classroom structures of first and second grade. In kindergarten, perhaps it is not necessary for one to be internally controlled in order to also be creative as it may be for older subjects in more structured settings. For females who are creative, it appears to be increasingly necessary for them to be internal as they develop and progress in school. Torrance (1961) found that teachers tend to reinforce creativity in male children and ignore or even discourage it in female children.

Further study should be designed to more clearly delineate developmental changes and sex differences for internal control in relation to creativity. Perhaps the use of several measures of creativity and internal-external locus of control would be necessary. A less abstract form for the internal measure may be required for kindergarten subjects. Experimental manipulation of the internal variable may provide further insight into its relation to creativity.

The present study has demonstrated the reliability of a flexibility score for the Ward (1968 a) creativity measures with kindergarten and second grade male and female subjects. It has also replicated the reliability of Ward's intercorrelations of scores for creativity measures, including the lower intercorrelations Ward found across measures. Moderate correlations between Instances and Uses found for male kindergarten subjects and female second grade subjects has presented an unclear picture of the creativity variable when examined in relation to internal control perception. The hypothesis that internal control perception is significantly related to creativity was supported for second grade male and female subjects, especially among second grade female subjects with the Instances measure. In contrast, male kindergarten subjects who were low in internal control perception tended to be more creative on the Uses creativity measure.

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APPENDIX A

BIALER LOCUS OF CONTROL SCALE

Instructions

This is not a test. I am just trying to find out how kids your age think about certain things. I am going to ask you some questions to see how you feel about these things. There are no right or wrong answers to these questions. Some kids may say "Yes" and some say "No." When I ask the question, if you think your answer should be yes, or mostly yes, say "Yes." If you think the answer should be no, or mostly no, say "No." Remember, different children give different answers, and there is no right or wrong answer. Just say "Yes" or "No," depending on how you think the question should be answered. If you want me to repeat a question, ask me. Do you understand? All right, listen carefully and answer "Yes" or "No."

1. When somebody gets mad at you, do you usually feel there is nothing you can do about it?

2. Do you really believe a kid can be whatever he wants to be?

3. When people are mean to you, could it be because you did something to make them be mean?

4. Do you usually make up your mind about something without asking someone first?

5. Can you do anything about what is going to happen tomorrow?

6. When people are good to you, is it usually because you did something to make them be good?

7. Can you ever make other people do things you want them to do?

8. Do you ever think that kids your age can change things that are happening in the world?

9. If another child was going to hit you, could you do anything about it?

10. Can a child your age ever have his own way?

11. Is it hard for you to know why some people do certain things?

12. When someone is nice to you, is it because you did the right things?

13. Can you ever try to be friends with another kid even if he doesn't want to?

14. Does it ever help any to think about what you will be when you grow up?

15. When someone gets mad at you, can you usually do something to make him your friend again?

16. Can kids your age ever have anything to say about where they are going to live?

17. When you get in an argument, is it sometimes your fault?
18. When nice things happen to you, is it only good luck?
19. Do you often feel you get punished when you don't deserve it?
20. Will people usually do things for you if you ask them?
21. Do you believe a kid can usually be whatever he wants to be when he grows up?
22. When bad things happen to you, is it usually someone else's fault?
23. Can you ever know for sure why some people do certain things?

APPENDIX B (TABLE 1)

COMPARISONS OF CREATIVITY INTERCORRELATIONS FOR KINDERGARTEN SUBJECTS OF WARD, 1968, AND ODEN, 1971

Measure	Fluency		Uniqueness	
	Instances	Uses	Instances	Uses
Instances (Fluency)	...	(.50-W) (.76-O)	(.92-W) (.96-O)	(.52-W) (.78-O)
Uses (Fluency)	(.72-W) (.52-O)	...	(.43-W) (.73-O)	(.85-W) (.96-O)
Instances (Unique.)	(.89-W) (.93-O)	(.66-W) (.52-O)	...	(.50-W) (.76-O)
Uses (Unique.)	(.60-W) (.39-O)	(.95-W) (.89-O)	(.55-W) (.44-O)	...

NOTE: Males to the left and below the diagonal (N=41, Ward; N=31, Oden); females to the right and above diagonal (N=46, Ward; N=29, Oden). W=Ward (1968); O=Oden (1971)

APPENDIX B (TABLE 2)

COMPARISON OF CREATIVITY INTERCORRELATIONS FOR SEVEN AND EIGHT YEAR OLD MALE SUBJECTS (WARD, 1968; ODEN, 1971)

Measure	Fluency		Uniqueness	
	Instances	Uses	Instances	Uses
Instances (Fluency)	...	...	(.96)	(.78)
Uses (Fluency)	...	...	(.83)	(.95)
Instances (Unique.)	(.92)	(.39)	...	(.77)
Uses (Unique.)	(.42)	(.94)	(.44)	...

NOTE: Ward's data to the left and below the diagonal; Oden's data to the right and above diagonal. N=34 (Ward); N=39 (Oden).

APPENDIX C

WARD'S CREATIVITY MEASURES

Instances

Now we have a game with words. The game is called: "Naming Things."
The first things we'll play this game with will be round things.
Let's see how many round things you can think of. Name some round things.

Can you think of anymore round things?

The next things we'll play this game with are wheels. Now let's see how many things with wheels you can think of. Name some things that have wheels.

Can you think of anymore things with wheels?

Now we'll play this game with little things. Let's see how many little things you can think of. Name some things that are little.

Can you think of anymore little things?

The last thing we'll play this game with are red things. Let's see how many things that are red you can think of. Name some red things.

Can you think of anymore red things?

Uses

Now we have a game called: "What can you use it for?" The first thing we'll play this game with is a newspaper. Name some things you can do with a newspaper, or play with a newspaper, or make with a newspaper. Tell me what can you use a newspaper for?

Can you think of anymore things you can use a newspaper for?

The next thing we'll play this game with is a table. Name some things you can do with a table, or play with it, or make with it. Tell me, what can you use a table for?

Can you think of anymore things you can use a table for?

Now we'll play this game with a table knife. What things can you use a table knife for?

Can you think of anymore things you can use a table knife for?

Now we'll play this game with a cup. What things can you use a cup for?

Can you think of anymore things you can use a cup for?

The last thing we'll play this game with is a coathanger. What things can you use a coathanger for?

Can you think of anymore things you can use a coathanger for?

APPENDIX D

CATEGORIES FOR ITEMS IN INSTANCES AND USES CREATIVITY MEASURES

A. Instances

a. Round Things

1. Animals and parts of--clams, oysters, turtleshell.
2. Bodies and parts of--blisters, chin, ear.
3. Buildings and parts of--barn, igloo.
4. Cleaning and Repairing Tools--mop, hose, sponge.
5. Clothes--glove, button.
6. Containers other than dishes, cups--bottle, garbage can.
7. Construction Tools, Items--bolt, chain, pole.
8. Dishes, cups, saucers--bowls, cups, glasses.
9. Fruits and Nuts.
10. Furniture--bed, table.
11. General Supplies--chalk, pen, pins.
12. Household Equipment and Items--carpet, drain, lock.
13. Illumination--battery, lights, stoplight.
14. Insects--bee, bugs.
15. Jewelry and Other Items of Adornments--rings, pipe.
16. Kitchen and Other Utensils and Equipment--rolling pin, pans.
17. Measurement, Time, Shape--clocks, circle, watch.
18. Meat and Other Food--bun, biscuit, cakes.
19. Money--coin, penny.
20. Music--bell, chimes.
21. Planets--Saturn, sun, world.

a. Round Things (continued)

22. Plants, Trees, Nature--field, rocks.

23. Recreation, Equipment for Play--baseball, hockey puck.

24. Toys, parts of--balloons, blocks.

25. Transportation--vehicles, wheels, trailers.

26. Vegetables--beans, tomato.

27. Weapon--arrows, bullet.

b. Wheels

1. Apparatus--bucket, cages, ladder.

2. Equipment with dials, controls--movie projector, watches.

3. Furniture--bed, chairs, tables.

4. Machines--factory motor, engine.

5. Toys--pull toys, truck.

6. Vehicles, motor--airplane, ambulance, bus.

7. Vehicles, nonmotor--bicycle, carriage, stroller.

c. Little Things

1. Animals--dog, cat.

2. Baby, children--baby bird.

3. Clothing--caps, socks, shoelace.

4. Construction Materials, Tools--bolt, nail, hammer.

5. Containers--boxes, can.

6. Dishes, bowls--pans, plates.

7. Food--bubblegum, egg.

8. Furniture--table, lamp.

9. Household Apparatus--broom, doorknob, lock

10. Householf Items--rag, tweezers, soap, needle.

c. Little Things (continued)

11. Insects--ants, flies.
12. Jewelry and Cosmetics, etc--items of personal adornment, beads, lipsticks.
13. Letters and other Communications--stamps, signs.
14. Machines and Equipment--pencil sharpener, pocket radio.
15. Marks, blemishes--bruise, bump, crack, period.
16. Medicine--band aid.
17. Money--coin, dime.
18. Music--bell, whistle.
19. Paper and General Supplies--books, chalks, crayons.
20. Particles--bubbles, dirt, piece of glass.
21. Parts of Bodies--ear, eye, fingernail.
22. Plants, nature--grass, stone.
23. Recreation--balls, bat.
24. Seeds--grain, pumpkin seeds.
25. Time, measurement--clock, map.
26. Toys--dolls, cars.
27. Transportation--wagon, wheels.
28. Weapon--arrow, hatchet.

d. Red Things (Red things were counted if they are things always, usually or frequently red.)

1. Animals, and parts of--bird, snake, robin.
2. Art Supplies only--chalk, crayons.
3. Bodies and parts of--blisters, blood, hair.
4. Buildings and parts of--barn, bricks.
5. Cleaning and Repairing Utensils--broom, mophandle, sponge.
6. Clothes--boots, hat.

d. Red Things (continued)

7. Cosmetics and other items of adornment--jewelry, scarf, lipstick.
8. Containers--bowls, pails.
9. Decorations--ornaments, stripes.
10. Designs and Shapes--circle, dots, stain.
11. Fruits and Vegetables--beans, cherry, tomato.
12. Other Food--pizza, ketchup, pepper.
13. Furniture and Household Equipment--ladder, lampshades.
14. Other Household Items--blanket, curtains.
15. Illumination--fire, lightbulb.
16. Insects--ant, bee.
17. Nature, plants--trees, roses.
18. Signs, and Labels--badge, exit sign.
19. General Supplies--books, pen, pencil, school tablet.
20. Toys, Recreation Equipment--balls, blocks.
21. Transportation and parts of vehicles--wagon, bike.
22. Yard Materials--rake, equipment.

B. Uses

a. Newspaper

1. Artistic--use for art, etc.
2. Cleaning--wiping, drying.
3. Cut out things--paper dolls.
4. Destruction, destroy--burn, tear.
5. Earn Money--deliver
6. Insulation or Protection--cover, use for bottom of cages.

a. Newspaper (continued)

7. Put Away--keep, carry off, stack, pile.
8. Reading--get information of various kinds.
9. Recreation--make noises, play games.
10. Make other things--envelopes.
11. Make Toys--airplane, boat.

b. Table

1. Destruction--burn, get rid of, saw it.
2. Do Things on--do art work, cook on.
3. Furniture--use as card table, bed table.
4. Use Materials for something else--make a door, raft.
5. Put Things on--put cake on, dishes.
6. Transport--carry it, slide around, tip.

c. Tableknife

1. Use for Art--carve names.
2. Cleaning, care for--scrape pan.
3. Cut food--cut apple.
4. Cutting (General)--cut paper.
5. Destruction (weapon)--break things.
6. Eat With--set table, eat steak.
7. Put Away (Transport)--keep out of reach.
8. Recreation--play like sword.
9. Shaping Things (and making things)--sharpen pencils.
10. Spreading--jelly, jam, butter.
11. As Tool or Utensil--open carton, undo buckle.
12. Utensil (General) Cooking--check potatoes.

d. Cup

1. Artistic--decorate, make Christmas trees.
2. Care for--clean, glue, put detergent in.
3. Cook with--measuring cup.
4. Destruction--bang it, drop.
5. Put drinks in, drink--milk for baby, drink coffee, put juice in.
6. Put Food in--eat out of.
7. Make Things (Other than Artistic)--make bell.
8. Play with--balance, catch things.
9. Pouring.
10. Put Things in--paper clips, etc.
11. Put away--in cupboard.

e. Coathanger

1. Artistic--make things, decorate, make mobile.
2. Change Shape--take apart, twist.
3. Destruction--weapon, break it, poke someone.
4. Hang Clothes.
5. Hang Things--hand towels, wig, things other than clothes.
6. Make other things--bow and arrow.
7. Put Away, transport--take on airplane.
8. Play With, recreation--fiddle with.
9. Use as tool or utensil--cook marshmellows, use as hook.